

Amendments to the Drawings:

The attached replacement drawing sheets including formal drawings of Figures 1A, 1B, 2A, 2B, 3A, 5A and 5B replace the original set of drawing sheets including Figures 1A, 1B, 2A, 2B, 3A, 5A and 5B.

Fig. 1A: A formal line drawing replaces the original figure. The formal line drawing represents a perspective of the interface device 10 featuring the front view of interface device 10. The formal drawing provides more spatial perspective regarding the arrangement of the device housing 16 and first and second contact members 12 and 14.

Fig. 1B: A formal line drawing replaces the original figure. The formal line drawing represents a top planar cross-section of the interface device 10 shown in Figure 1A. The original Figure 1B was also a cross-section of original Figure 1A but was incorrectly labeled as a side view of interface device 10 in the description of the drawings. The formal line drawing more clearly and accurately represents the cross-sectional details of interface device 10, specifically with regard to the arrangement of device housing 16 and first and second contact members 12 and 14.

Fig. 2A: A formal line drawing replaces the original figure. The formal line drawing represents a perspective of the interface device 30 featuring the front view of interface device 30. The formal drawing provides more spatial perspective regarding the arrangement of the device housing 36 and first and second contact members 32 and 34.

Fig. 2B: A formal line drawing replaces the original figure. The formal line drawing represents a top planar cross-section of the interface device 30 shown in Figure 2A. The original Figure 2B was also a cross-section of original Figure 2A but was incorrectly labeled as a side view of interface device 30 in the description of the drawings. The formal line drawing more clearly and accurately represents the cross-sectional details of interface device 30, specifically with regard to the arrangement of device housing 36 and first and second contact members 32 and 34.

Fig. 3A: A formal line drawing replaces the original figure. No substantive changes were made.

Fig. 5A: A formal line drawing replaces the original figure. The formal line drawing represents the claimed embodiment in clearer form while also providing more accurate spatial and interconnecting perspective. Specifically, the first contact pins 110 and 110' are shown in more accurate spatial correspondence with other 110 and 110' pins and the contact points 104-6 with which pins 110 and 110' connect. Also, contact pins 120 are shown in more accurate spatial correspondence with integrated circuits 108 with which contact pins 120 connect.

Fig 5B: A formal line drawing replaces the original figure. The formal line drawing presents the claimed embodiment in clearer form while also providing more accurate spatial and interconnecting perspective. Specifically, the first contact pins 110 are shown in more accurate spatial correspondence with other 110 pins and the contact points 104-6 with which pins 110 connect. Also, contact pins 120 and 120' are shown in more accurate spatial correspondence with integrated circuits 108 with which contact pins 120 and 120' connect.

Attachments: Replacement Sheets (2), including amended Figures 1A, 1B, 2A, 2B, 3A, 5A and 5B.

REMARKS

Claims 4, 11, 28, 31, 39 and 44 are pending. Claims 1-3, 5-10, 12-27, 29-30, 32-38, 40-43 and 45-47 have been canceled in this amendment. Claims 4 and 31 were amended to incorporate the recitation of claim 10. Claims 11 and 39 were amended to incorporate the recitation of claim 13 and to more particularly point out and distinctly claim the present invention. Claim 28 was amended to more particularly point out and distinctly claim the present invention. For at least the reasons set forth below, withdrawal of all outstanding rejections is respectfully requested.

The new language in claims 11 and 39 is supported by at least original claim 13, Figure 3A and page 14, lines 13-14 in paragraph [037] of the specification. The new language in claim 28 is supported by at least Figures 5A and 5B, page 17, lines 9-14 of paragraph [050] and page 18, lines 1-8 of paragraph [052] of the specification.

The specification has been changed to properly identify Figures 1B and 2B as the top planar cross-sectional views that they in fact represent and not as side views as was incorrectly stated in the original specification. Support for this change can be found in the original Figures 1B and 2B which are clearly top planar cross-sectional views. The specification was also changed to identify Figures 1A and 2A as perspective views which replaced the original front views of original Figures 1A and 2A. This substitution was made to accommodate the Examiner's requirement for more spatial perspective. Support for the perspective views can be found in the original Figures 1A, 1B, 2A and 2B as well as in the specification in paragraphs [031] to [035].

Figures 1A, 1B, 2A, 2B, 5A and 5B have been amended to provide more spatial perspective and additionally, in the case of Figures 1B and 2B, to provide more accurate cross-sectional detail. Support for the modifications for Figures 1A, 1B, 2A and 2B can be found in the original Figures 1A, 1B, 2A and 2B as well as the original specification in paragraphs [031] to [035]. Support for the modifications to Figures 5A and 5B can be found in original Figures 5A and 5B as well as in the specification in paragraphs [050] – [052]. Figure 3A was replaced with a formal line drawing with no changes.

Accordingly, no new matter has been added.

Request for Interview Prior to Formal Action on Amendment

Applicants request an interview prior to formal action on this response. An "Applicant Initiated Interview Request Form" accompanies this response. Please contact Applicants' undersigned representative to schedule the interview.

Drawing Objection

The Examiner has objected to Figures 1A, 1B, 2A, 2B, 5A and 5B as lacking proper spatial perspective. The application has been amended to include replacement sheets that replace original Figures 1A, 1B, 2A, 2B, 5A and 5B with formal line drawings that provide improved spatial perspective of the views previously provided and, in the case of Figures 1B and 2B, to provide more accurate cross-sectional detail.

For Fig. 1A, the formal line drawing represents a perspective of the interface device 10 featuring the front view of interface device 10. The formal drawing provides more spatial perspective regarding the arrangement of the device housing 16 and first and second contact members 12 and 14.

For Fig. 1B, the formal line drawing represents a top planar cross-section of the interface device 10 shown in Figure 1A. The original Figure 1B was also a cross-section of original Figure 1A but was incorrectly labeled as a side view of interface device 10 in the description of the drawings. The formal line drawing more clearly and accurately represents the cross-sectional details of interface device 10, specifically with regard to the arrangement of device housing 16 and first and second contact members 12 and 14.

For Fig. 2A, the formal line drawing represents a perspective of the interface device 30 featuring the front view of interface device 30. The formal drawing provides more spatial perspective regarding the arrangement of the device housing 36 and first and second contact members 32 and 34.

For Fig. 2B, the formal line drawing represents a top planar cross-section of the interface device 30 shown in Figure 2A. The original Figure 2B was also a cross-section of original

Figure 2A but was incorrectly labeled as a side view of interface device 30 in the description of the drawings. The formal line drawing more clearly and accurately represents the cross-sectional details of interface device 30, specifically with regard to the arrangement of device housing 36 and first and second contact members 32 and 34.

For Fig. 3A, no substantive changes were made.

For Fig. 5A, the formal line drawing represents the claimed embodiment in clearer form while also providing more accurate spatial and interconnecting perspective. Specifically, the first contact pins 110 and 110' are shown in more accurate spatial correspondence with other 110 and 110' pins and the contact points 104-6 with which pins 110 and 110' connect. Also, contact pins 120 are shown in more accurate spatial correspondence with integrated circuits 108 with which contact pins 120 connect.

For Fig. 5B, the formal line drawing presents the claimed embodiment in clearer form while also providing more accurate spatial and interconnecting perspective. Specifically, the first contact pins 110 are shown in more accurate spatial correspondence with other 110 pins and the contact points 104-6 with which pins 110 connect. Also, contact pins 120 and 120' are shown in more accurate spatial correspondence with integrated circuits 108 with which contact pins 120 and 120' connect.

Accordingly, Applicants respectfully request the Examiner reconsider and withdraw the objections to the Drawings.

Prior Art Rejections

Claims 1-5 and 9-10 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,208,968 (Camsell et al.).

Claims 1-10, and 31-33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Camsell in view of U.S. Patent No. 5,564,933 (Bouchan et al.) and U.S. Patent No. 5,662,483 (Park et al.).

Claims 11-30 and 34-47 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Camsell in view of U.S. Patent No. 4,985,870 (Faraci) and U.S. Patent No. 6,804,119 (Ziemkowski).

Withdrawal of these rejections is respectfully requested for at least the following reasons.

1. Patentability of independent claim 4 over Camsell,
Patentability of independent claim 4 over Camsell in view of Bouchan and Park, and
Patentability of independent claim 31 over Camsell in view of Bouchan and Park

Amended claim 4 reads as follows (underlined for emphasis):

An interface device coupled to a board on which integrated circuits are mounted for providing electrostatic discharge protection for the integrated circuits comprising:

a plurality of first contact members of a first length, each of the first contact members including one end connected to the board and the other end to connect to an external device; and

at least two second contact members of a second length, each of the second contact members being connected to a voltage line of a voltage level, wherein one of the at least two second contact members include (i) one contact member connected to a first voltage line of a first voltage level, and (ii) another contact member connected to a second voltage line of a second voltage level smaller than the first voltage level;

wherein the second length is greater than the first length such that when the board is coupled to the external device through the interface device in a direction, the second contact members contact the external device earlier than the first contact members.

Amended claim 31 reads as follows (underlined for emphasis):

A method of providing electrostatic discharge protection for integrated circuits formed on a board, comprising:

providing an interface device including:

a plurality of first contact members of a first length, each of the first contact members including one end connected to the board and the other end to connect to an external device; and

at least two second contact members of a second length connected to a voltage line of a voltage level wherein one of the at least two second contact members include one connected to a first voltage line of a first voltage level, and another connected to a second voltage line of a second voltage level smaller than the first voltage level;

providing the at least two second contact members with a length greater than the length of each of the first contact members;

coupling the board to the external device through the interface device; and

discharging electric charges accumulated on the board via the at least two second contact members.

a. Anticipation of Claim 4 by Camsell

Camsell discloses a device that when coupled to a board containing devices sensitive to electrostatic discharge, allows for connections of various lengths to an external device. See, Camsell Figure 2 and column 2, lines 25-31. Specifically, Figures 2 and 5 of Camsell disclose multiple pins (16', 16'' and 16''') of three distinct lengths of insertion (D1, D2 and D3). The specification in column 2, lines 25-31 discloses that the device of Figure 2 can assist in discharging electrostatic discharge from the board by allowing for ground connection to be made first via 16''' at longest insertion length D3 when the board is connected to an external device. Further, Camsell discloses that power connection would be made after the ground connection via 16'' at insertion length D2, less than D3. Signal connections from the board to external device would be made via 16' at insertion length D1, less than D2, after ground and power connections are made. Camsell does not disclose in the figures or the specification that pin(s) 16'' can or should be connected to two distinct voltage levels with one level being higher than the second level. To the contrary, as indicated above, in column 2, lines 25-31 Camsell urges that a pin of a different length, 16''' at a different insertion length be used to connect the ground connection while 16'' connects the power connection.

In contrast to Camsell, amended claim 4 recites an interface device in which at least two second contact members of a second length each connect to a voltage line of a voltage level, the

first voltage level being higher than the second voltage level. As such, the recited device of claim 4 has at least two connection contact members that are of the same length that connect to distinct voltage levels, one higher than the other. This would allow for the simultaneous connection of two distinct voltage levels via the interface device of the board to an external device that employs two distinct voltage levels. Since Camsell does not disclose pin(s) 16' connecting to power and also to ground (the function of pin 16'') or to another, different voltage level, Camsell does not anticipate the interface device recited in claim 4. Accordingly, the Applicants request that the Examiner reconsider and withdraw the rejection of claim 4.

b. Obviousness of Claims 4 and 31 over Camsell in view of Bouchan and Park

Bouchan, in Figures 2 and 3, discloses an interface device 18 that contains a plurality of signal terminals 24 and a pair of ground terminals 26. Bouchan further teaches that a receptacle device 42 connected to a board containing integrated circuits 32 receives the terminals 24 and 26 associated with device 18 via connection terminals 46 and 48. Receptacle pins 48 are associated with ground terminals 26. Given the geometry of receptacles 48, ground contact is made with the board containing the integrated circuits before contact is made with the signal receptacles 46. Bouchan does not disclose terminals or receptacles associated with two distinct voltage levels. Thus, the interface device disclosed by Bouchan does not disclose two terminal connections in device 18 associated with two distinct voltage levels that have associated receptacle pins of a certain length in device 42. Bouchan only discloses two ground connections that will interface with the board before the signal connections contact the board and therefore provide a discharge path for electrostatic charge via ground only.

Since Bouchan does not disclose an interface device in which at least two connection pins (contact members or receptacles) of the same connection/insertion length connect to distinct voltage levels, one level higher than the other, then Bouchan does not disclose or suggest the necessary modification to Camsell that would make the interface device recited in claim 4 obvious.

Figures 6 and 7 of Park discloses conducting receptacle fingers 76 and 77 that are disposed at different lengths toward the receptacle surface 30. As disclosed in column 4, lines 44-55, the fingers 76 are offset in the receptacle at a point closer to the surface 30 in order to

contact the connecting device's ground conductors before the fingers 77 contact the connecting device's signal conductors. Like Bouchan, the offset in Park relating to the location of fingers 76 and 77 to the mating surface 30 is intended to provide a ground connection between the interfacing devices before any signal connection is made so that any electrostatic discharge is drained to ground. Park does not disclose two receptacle fingers of a common offset intended to provide a connection between the interfacing devices for two distinct voltage levels, one higher than the other. Thus, Park does not disclose or suggest the necessary modification to Camsell in view of Bouchan that would make the interface device recited in claim 4 obvious.

Accordingly, the Applicants request that the Examiner reconsider and withdraw the rejection of claim 4.

Claim 31 recites a method for discharging electrostatic discharge from a board containing integrated circuits using an interface device similar to that recited in claim 4. Accordingly claim 31 is believed to be patentable for the same reasons as given above with respect to claim 4.

2. Patentability of independent claims 11 and 39 over
Camsell in view of Faraci and Ziemkowski

Amended claim 11 reads as follows (underlining for emphasis):

An interface device formed on a board on which integrated circuits are mounted for providing electrostatic discharge protection for the integrated circuits, comprising:

a plurality of first contact lines of a first length, each of the first contact lines including one end connected to the board and the other end to connect to an external device, the one ends of the first contact lines being aligned to an aligning line;

at least one second contact line of a second length corresponding to at least one voltage line of a first voltage level to which the integrated circuits are connected, each of the at least one second contact line being connected to a corresponding voltage line at one end aligned with the aligning line; and

a third contact line directly connected to a second voltage level including a third length measured from the aligning line to one end of the third contact line;

wherein the second length and the third length are greater than the first length and the third length is equal to the second length such that

when the board is coupled to the external device, electric charges accumulated on the board are discharged via at least one of the third contact line or second contact line.

Amended claim 39 reads as follows (underlining for emphasis):

A method of providing electrostatic protection for integrated circuits formed on a board, comprising:

- forming a plurality of a first contact lines of a first length on the board;
- providing each of the first contact lines with one end connected to the board and the other end to connect to an external device;
- aligning the one ends of the first contact lines to an aligning line;
- forming at least one second contact line of a second length greater than the first length on the board corresponding to at least one voltage line of a first voltage line of a first voltage level to which the integrated circuits are connected;
- providing each of the at least one second contact line with one end aligned to the aligning line;
- connecting the one end of each of the at least one second contact line to a corresponding voltage line;
- forming a third contact line directly connected to a second voltage level;
- providing the third contact line with a third length measured from the aligning line to one end of the third contact line, the third length being greater than the first length and the third length being equal to the second length;
- coupling the board to the external device; and
- discharging electric charges accumulated on the board via at least one of the third contact line or second contact line.

Figure 10 and column 4, lines 1-21 of Faraci discloses contact lines 32 and 34 that are connected to trace (voltage) lines 26 that connect the contact lines 32 and 34 to ground (reference voltage) and voltage (VCC) levels, respectively. Contact lines 24 are connected to various integrated circuit 16 connection points via trace lines 26. Contact lines 34 and 32, of equal length and disposed toward the edge 22 of the board 12 at equidistant lengths allow for the connection of positive voltage and ground voltage (reference) between the board 12 and an external device 28 simultaneously before signal connection is made via contact lines 24. All voltage/ground contact lines disclosed by Faraci are connected to the voltage/ground level via

trace lines (voltage lines) 26. Thus, Faraci does not disclose a contact line directly connected to a second voltage level.

In contrast to Faraci, the interface device formed on a board recited in claim 11 contains an element of a third contact line directly connected to a voltage level. This particular kind of contact line does not require or utilize a trace line (or voltage line) to connect to the voltage level. As disclosed in Figure 3A in the application and in paragraph [037] of the specification spanning pages 13-14, the third contact line contacts the second voltage level on the board directly without the interconnection of a voltage line. Faraci does not disclose any such kind of contact line. To the contrary, all of the contact lines disclosed in Faraci (24, 32 and 34) are connected to the board 12 via trace lines 26. Accordingly, Faraci does not disclose a third contact line (connected to anything) and therefore does not disclose or suggest the modification of Camsell to include a third contact line.

Figure 1 of Ziemkowski discloses a circuit board 10 with contact lines 12, 13 and 14. The contact line 12 is the longest of the contact lines and is disposed closest to the interface edge of the board 10. Column 3, lines 22-39 of Ziemkowski states that contact line 12 connects the ground reference of board 10 to an external device, contact line 13 connects the power (positive voltage) reference of the board 10 to an external device, and contacts 14 connect signal references from the board 10 to an external device. The intention behind this configuration is to allow electrostatic charge that may accumulate on board 10 to drain through the ground contact 12 at the time of connection before it can drain through the signal contacts 14 and damage the integrated circuits on board 10.

Ziemkowski also discloses in column 3, lines 57-62 that the board 10 has a circuit trace 16 (voltage line) on a different layer of board 10 that connects via 15 to an electrostatic discharge reference voltage and that voltage may be ground. Thus, contact line 12 is connected to the voltage level ground of the board 10 via a trace line 16 or other. In view of this configuration, contact line 12 is not connected directly to a voltage level of board 10 and therefore cannot be considered a third contact line as recited in claim 11. Therefore, Ziemkowski does not disclose or suggest the modification of Camsell to include a third contact line.

Accordingly, the Applicants request that the Examiner reconsider and withdraw the rejection of claim 11.

Claim 39 recites a method for discharging electrostatic discharge from a board containing integrated circuits using an interface device formed on a board similar to that recited in claim 11. Accordingly claim 31 is believed to be patentable for the same reasons as given above with respect to claim 11.

3. Patentability of independent claims 28 and 44 over
Camsell in view of Faraci and Ziemkowski

Amended claim 28 reads as (underlining for emphasis):

A detecting system for detecting integrated circuits formed on a board,
comprising:

- a test device including a first board;
- a plurality of first pins formed on the first board;
- a second board including a first surface and a second surface;
- a plurality of first contact points formed on the first surface of the second board to receive the first pins;
- a plurality of second pins formed on the second surface of the second board; and
- a plurality of second contact points formed on each of the integrated circuits to receive the second pins,

wherein the plurality of first pins includes one or more first pins that are longer in length than the other first pins, or the plurality of second pins includes one or more second pins that are longer in length than the other second pins;

wherein electric charges accumulated on the board on which the integrated circuits are formed are discharged from one or more of the longer first pins or longer second pins.

Referring to claim 28, neither Faraci nor Ziemkowski disclose or suggest the modification of Camsell that would provide the structure of the recited detecting system. Specifically, none of Faraci, Ziemkowski or Camsell disclose or suggest “a second board including a first and second surface” or “a plurality of second pins formed on the second surface of the second board” or “a plurality of second contact points formed on each of the integrated circuits to receive the second pins.”

Accordingly, neither Faraci nor Ziemkowski disclose or suggest the modification of Camsell to include the structure underlined in claim 28. Therefore, the Applicants request the Examiner reconsider and withdraw the rejection to claim 28.

Claim 44 recites a method for providing electrostatic discharge protection in a detecting system for integrated circuits formed on a board using a protection device similar to that recited in claim 28. Accordingly claim 44 is believed to be patentable for the same reasons as given above with respect to claim 28.

Conclusion

Insofar as the Examiner's rejections were fully addressed, the present application is in condition for allowance. Issuance of a Notice of Allowability of all pending claims is therefore requested.

Respectfully submitted,

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